

REMARKS

Claims 1-7, 9, and 11-20 are pending in the present application. Claims 1-7, 9, and 11-20 have been rejected. The specification has been amended. Support for these amendments herein presented can be found in the specification and claims as filed. No new matter has been introduced by these amendments. Reconsideration and allowance is respectfully requested in view of the amendments and the following remarks.

The Use of Trademarks

The Examiner has noted that trademarks are used throughout the application. The Applicant has amended the specification as indicated above. Reconsideration of these amendments is respectfully requested.

The Double Patenting Rejection

Claims 1-7, 9, and 11-20 are rejected under the doctrine of obviousness-type double patenting as being unpatentable over Claims 1-5 and 8-16 of copending Application No. 09/108,875.

The Advisory Action mailed on April 23, 2002 indicates that the Applicant's reply of November 11, 2001 including the submittal of the Terminal Disclaimer overcame the obvious-type double patenting rejection.

The § 103 Rejections

Claims 1, 3-7, 9 and 11-20 stand rejected under 35 USC § 103(a) as being unpatentable over Dubin (US Patent 5,284,492) in view of WO 95/27021 and Schwab (US Patent 5,669,938). Applicants respectfully disagree with the Examiner's assertions.

Applicants note that the Examiner has inadvertently included Claim 10 in this rejection. Claim 10 was cancelled in an amendment filed on October 6, 1999 prior to the

filing of this Continued Prosecution Application. Applicant is responding to this rejection with the understanding that Claim 10 has been previously cancelled.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art must have had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996). To establish *prima facie* obviousness of a claimed invention, all claim limitations must be taught by the prior art. *In re Royka*, 180 USPQ 580 (CCPA 1974). All words in a claim must be considered in judging the patentability of that claim against the prior art. *In re Wilson*, 165 USPQ 494 (CCPA 1970).

Dublin teaches an improved lubricity water and fuel oil emulsion. The emulsion is used as fuel for an electric power generating turbine, and includes a lubricity additive selected from the group consisting of dimer acids, trimer acids, phosphate esters, sulfurized castor oil, and mixtures thereof. (Abstract) As the Examiner points out, Dublin teaches the use of water, and although demineralized water is not required, the use of demineralized water is preferred. (Col. 4, lines 30-38) Claim 1 claims the use of “purified water”. Demineralized water and ‘water’ are not the same as purified water. As stated in the specification on page 5, paragraph 2, lines 14-28,

The water is preferably purified such that it contains very low concentrations of ions and other impurities, particularly calcium ions, magnesium ions, and silicon. This is desirable because impure water contributes to ashing and engine deposit problems after long-term use, which can lead to wear, corrosion, and engine failure. The purified water preferably contains no greater than about 50 parts per million calcium and magnesium ions, and no greater than about 20 parts per million silicon. More preferably, the purified water has a total hardness of less than 10 parts

per million and contains no greater than about 2 parts per million calcium and magnesium ions, and no greater than about 1 part per million silicon.

As stated in the specification, purified water contains very low concentrations of ions and other impurities. Purified water is not demineralized water and not conventional “water”. Demineralized water does not have any mineral concentrations in the water, hence demineralized. As stated in the specification, purified water contains very low concentrations of ions, specifically calcium ions, magnesium ions and silicon. Therefore, a low concentration of minerals can be present in the purified water.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 180 USPQ 580 (CCPA 1974). Since the Dublin reference does not teach “purified water” as claimed in Claim 1, it does not teach each and every element of Claim 1. The WO 95/27021 and Schwab references also do not teach the use of “purified water” as claimed in Claim 1, and therefore do not remedy the deficiency of the Dublin reference. The Examiner has failed to make a *prima facie* case of obviousness.

Thus, Claim 1 is non-obvious. If an independent claim is non-obvious under 35 U.S.C. 103, then any claim depending therefrom is non-obvious. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). Therefore, Claims 2-7, 9, and 11-20, depending from non-obvious independent Claim 1, are then also non-obvious. Applicants respectfully request withdrawal of this rejection and reconsideration.

Claims 1, 3-7, 9 and 10-20 stand rejected under 35 USC § 103(a) as being unpatentable over Peter-Hoblyn, et al. (US Patent 5,743,922), in view of WO 95/27021 and Schwab. Applicants respectfully disagree with the Examiner’s assertions.

As indicated above, Applicants note that the Examiner has inadvertently included Claim 10 in this rejection. Claim 10 was cancelled in an amendment filed on October 6, 1999 prior to the filing of this Continued Prosecution Application. Applicant is responding to this rejection with the understanding that Claim 10 has been previously

cancelled.

As stated above, to establish *prima facie* obviousness of a claimed invention, all claim limitations must be taught by the prior art. *In re Royka*, 180 USPQ 580 (CCPA 1974). All words in a claim must be considered in judging the patentability of that claim against the prior art. *In re Wilson*, 165 USPQ 494 (CCPA 1970).

Peter-Hoblyn, et al. teach an improved lubricity water and fuel oil emulsion. The emulsion is used as fuel for diesel engines and includes a lubricity additive selected from the group consisting of dimer acids, trimer acids, phosphate esters, sulfurized castor oil, and mixtures thereof. (Abstract) As the Examiner points out, Peter-Hoblyn, et al. teaches the use of water, and although demineralized water is not required, the use of demineralized water is preferred. (Col. 3, lines 4-11) Claim 1 claims the use of “purified water”. Demineralized water and ‘water’ are not the same as purified water. As stated above and in the specification on page 5, paragraph 2, lines 14-28, purified water contains very low concentrations of ions and other impurities. These ions and impurities would be found in ‘water’. Purified water is not demineralized water. Demineralized water does not have any mineral concentrations in the water, hence demineralized. As stated in the specification, purified water contains very low concentrations of ions, specifically calcium ions, magnesium ions and silicon. Therefore, a low concentration of minerals can be present in the purified water.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 180 USPQ 580 (CCPA 1974). Since the Peter-Hoblyn, et al. reference does not teach “purified water” as claimed in Claim 1, it does not teach each and every element of Claim 1. The WO 95/27021 and Schwab references also do not teach the use of “purified water” as claimed in Claim 1, and therefore do not remedy the deficiency of the Peter-Hoblyn, et al. reference. The Examiner has failed to make a *prima facie* case of obviousness.

Thus, Claim 1 is non-obvious. If an independent claim is non-obvious under 35 U.S.C. 103, then any claim depending therefrom is non-obvious. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). Therefore, Claims 2-7, 9, and 11-20, depending from non-obvious independent Claim 1, are then also non-obvious. Applicants respectfully request withdrawal of this rejection and reconsideration.

The § 112 Rejection

Claim 2 has been rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. The Examiner states that “[t]here is no support in the specification as filed for the now claimed limitation of an average droplet diameter of between about 5 microns and about 6 microns, i.e., the specification, as originally filed, teaches an average droplet diameter of about 4 to about 6 microns.”

The specification teaches, on page 10, paragraph 4, lines 28-31, “The resulting product is a stable, homogeneous, milky emulsion having an average droplet diameter less than about 10 microns, preferably ranging from about 4 to about 6 microns.” First, 5 microns is claimed within the phrase “less than about 10 microns” since 5 microns is less than 10 microns, and therefore can be claimed in the present Application’s claims. Secondly, the original Claim 2 stated that the average droplet diameter was “between about 4 microns and about 6 microns”. About 5 microns is between about 4 microns and about 6 microns and therefore, there is sufficient support in the specification for a change in the claim to 5 microns from 4 microns. Reconsideration and withdrawal of this rejection is respectfully requested.

In view of the foregoing, consideration and an early allowance of this application are earnestly solicited.

Respectfully submitted,
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VERSION WITH MARKED-UP CHANGES:

In the Specification:

Please amend the following paragraphs as follows:

Page 6, line 27 to Page 8, line 30:

Examples of suitable components for the surfactant package include alkylphenolethoxylates, alcohol ethoxylates, fatty alcohol ethoxylates, and alkyl amine ethoxylates. Of these, the alkylphenolethoxylates and alcohol ethoxylates are preferred. Of the alkylphenolethoxylates, polyethoxylated nonylphenols having between 8 and 12 moles of ethylene oxide per mole of nonylphenol are preferred. An example nonylphenol, 2, 6, 8-Trimethyl-4-nonyloxypolyethyleneoxyethanol is commercially available, e.g., from Union Carbide under the trade designation "TERGITOL TMN-10". Another nonylphenol ethoxylate NP-9 available from Shell under the trade designation "NP-9EO", added at 1000-3000 ppm. A preferred alcohol ethoxylate is a C₁₁ alcohol ethoxylate with 5 moles of ethylene oxide per mole of alcohol commercially available from Shell as "[Neodol]NEODOL N1-5 Surfactant". Additional preferred surfactant components include, for example, Pluronic 17R-2 [octylphenoxypolyethoxyethanol] (a block copolymer produced by BASF) added at 100 - 300 ppm; CA-720 an octylphenol aromatic ethoxylate available from Rhone-Poulenc as "[Igepal]IGEPAL CA-720" added at 1000-3000 ppm; and X-102 an ethoxylated alkyl phenol available from Union Carbide as "TRITON X-102" added at 1000 - 2000 ppm.

The fuel composition preferably includes one or more lubricants to improve the slip of the water phase and for continued smooth operation of the fuel delivery system. The amount of lubricant generally ranges from about 0.04% to 0.1% by weight, more preferably from 0.04% to 0.05% by weight. Suitable lubricants include a combination of mono-, di-, and tri-acids of the phosphoric or carboxylic types, adducted to an organic backbone. The organic backbone preferably contains about 12 to 22 carbons. Examples include mixed esters of alkoxylated surfactants in the phosphate form, and di- and tri-

acids of the Diels-Alder adducts of unsaturated fatty acids. The carboxylic types are more preferred because of their ashless character. A specific example of a suitable lubricant is [Diacid]DIACID 1550™ (Atrachem [Latol]LATOL 1550 or Westvaco Chemicals [Diacid]DIACID 1550), which is preferred due to its high functionality at low concentrations. The [Diacid]DIACID 1550 also has nonionic surfactant properties. Neutralization of the phosphoric and carboxylic acids, preferably with an alkanolamine, reduces possible corrosion problems caused as a result of the addition of the acid. Suitable alkanolamine neutralizers include amino methyl propanol, triethanolamine, and diethanolamine, with amino methyl propanol (available from Angus Chemical under the trade designation "AMP-95") being preferred. Preferred compositions include about 0.05 to 0.4% by weight neutralizer, more preferably about 0.06%.

The fuel composition may also include one or more corrosion inhibitors, preferably one that does not contribute a significant level of inorganic ash to the composition. Aminoalkanoic acids are preferred. An example of a suitable corrosion inhibitor is available from the Keil Chemical Division of Ferro Corporation under the trade designation "[Synkad]SYNKAD 828". Preferred compositions include about 0.05% by weight corrosion inhibitor.

The fuel composition may also include one or more ignition delay modifiers, preferably a cetane improver, to improve fuel detonation characteristics, particularly where the fuel composition is used in compression ignited engines. Examples include nitrates, nitrites, and peroxides. A preferred ignition delay modifier is 2-ethylhexylnitrate (2-EHN), available from Ethyl Corporation under the trade designation "[HiTec]HITECH 4103". Ammonium nitrate can also be used as a cetane improver with the additional benefit of possessing emulsion stabilization properties. Preferred compositions include about 0.1% to 0.4% by weight ignition delay modifier.

Page 9, lines 7 to 29:

The fuel composition may also include one or more coupling agents (hydrotropes) to maintain phase stability at high temperatures and shear pressures. High temperature and shear pressure stability is required, for example, in compression ignited (diesel) engines because all the fuel delivered to the injectors may not be burned to obtain the required power load in a given cycle. Thus, some fuel may be recirculated back to the fuel tank. The relatively high temperature of the recirculated fuel, coupled with the shear pressures encountered during recirculation, tends to cause phase separation in the absence of the coupling agent. Examples of preferred coupling agents include di-and tri-acids of the Diels-Alder adducts of unsaturated fatty acids. A specific example of a suitable coupling agent is [Diacid]DIACID 1550, neutralized with an alkanolamine to form a water soluble salt. Suitable alkanolamine neutralizers include amino methyl propanol triethanolamine, and diethanolamine, with amino methyl propanol preferred. The amount of the coupling agent typically ranges from about 0.04% to 0.1 % by weight, more preferably 0.04 to 0.05%.

Pages 12 and 13, Example 1 Table:

	ppm	Percent
Diesel	(balance	67%
H2O	300,000	30.00%
MeOH	20,000	2.00%
X-102	1,600	0.16%
N1-5	800	0.08%
TMN-10	800	0.08%

DA-1550	400	0.04%
AMP-95	600	0.06%

[Synkad] <u>SYNKAD</u>	500	0.05%
2-EHN	3,700	0.37%

Page 13, lines 2-4:

The fuel composition was prepared by first mixing the [Diacid]DIACID 1550, AMP-95, [Synkad]SYNKAD 828, X-102, N1-5, and TMN-10 with the methanol.[.] The mixture was agitated.

Page 13, Example 2 Table:

Diesel Fuel	67%
Highly purified water	30%
Methanol	2.00%
2-EHN	0.37%
DA-1550	400 ppm
AMP 95	600 ppm
[Synkad] <u>SYNKAD</u> 828	500 ppm
N1-5	1000 ppm
NP9	3000 ppm

Page 14, Example 3 Table:

Diesel Fuel	67%
Highly purified v/ater	30%
Methanol	2.00%
2-EHN	0.37%
DA-1550	400 ppm
AMP 95	600 ppm
[Synkad] <u>SYNKAD</u> 828	500 ppm
TMN10	1000 ppm

NP9	2000 ppm
17R2	100 ppm

Page 14, Example 4 Table:

Diesel Fuel	67%
Highly purified water	30%
Methanol	2.00%
2-EHN	0.37%
DA-1550	400 ppm
AMP 95	600 ppm
[Synkad] <u>SYNKAD</u> 828	500 ppm
N1-5	1000 ppm
TMN10	1000 ppm
CA720	2000 ppm

Page 14, line 9, to page 15, line 8:

For Examples 1 - 4: the diesel fuel was EPA Emissions Certification Diesel Fuel; the water was purified by reverse osmosis; X-102 is Union Carbide [Triton]TRITON X-102; TMN-10 is Union Carbide [Tergitol]TERGITOL TMN-10 surfactant; N1-5 is Shell [Neodol]NEODOL N1-5 surfactant; DA-1550 is Atrachem [Latol]LATOL 1550 (or Westavco Chemicals [Diacid]DIACID 1550); AMP-95 is 2-amino-2-methyl-1-propanol; [Synkad]SYNKAD 828 is Ferro [Synkad]SYNKAD 828; 2-EHN is Ethyl Corp. 2-ethylhexyl nitrate; CA-720 is Rhone-Poulenc "[Igepal]IGEPAL CA-720"; NP 9 is Shell "NP-9EO"; and 17R2 is BASF "[Pluronic]PLURONIC 17R-2".